

**IN THE CLAIMS:**

Please CANCEL claim 30 in accordance with the following:

1-3. (CANCELLED)

4. (PREVIOUSLY PRESENTED) A lithium-sulfur battery comprising:  
a positive electrode including an active material including lithium;  
a negative electrode having another active material including sulfur; and  
an electrolyte disposed between the positive and negative electrodes, the electrolyte comprising:

a first solvent having a dielectric constant that is greater than or equal to 20;  
a second solvent selected from a group consisting of methylethyl ketone, pyridine, methyl formate, n-propyl acetate, ethyl ether, methylethyl carbonate, toluene, fluorotoluene, benzene, fluorobenzene, p-dioxane, and cyclohexane; and  
an electrolyte salt,

wherein:

the first solvent is between 20% inclusively and 40% by volume of the electrolyte,  
and

the second solvent is roughly between 80% and about 60% by volume of the electrolyte.

5-7. (CANCELLED)

8. (PREVIOUSLY PRESENTED) The lithium-sulfur battery of claim 4, wherein said electrolyte salt is at least one selected from a group consisting of lithium hexafluorophosphate ( $\text{LiPF}_6$ ), lithium tetrafluoroborate ( $\text{LiBF}_4$ ), lithium hexafluoroarsenate ( $\text{LiAsF}_6$ ), lithium perchlorate ( $\text{LiClO}_4$ ), lithium trifluoromethane sulfonyl imide ( $\text{LiN}(\text{CF}_3\text{SO}_2)_2$ ), and lithium trifluorosulfonate ( $\text{CF}_3\text{SO}_3\text{Li}$ ).

9. (PREVIOUSLY PRESENTED) The lithium-sulfur battery of claim 4, wherein a concentration of said electrolyte salt is roughly between 0.5 M and 2.0 M.

10. (PREVIOUSLY PRESENTED) A lithium-sulfur battery comprising:

a negative electrode comprising a negative active material selected from a group consisting of lithium metal, lithium-containing alloy, a combination electrode of a lithium/inactive sulfur, a compound that can reversibly intercalate lithium ion, and a compound that can reversibly redioxide with a lithium ion at a surface;

an electrolyte comprising a first solvent having a dielectric constant that is greater than or equal to 20, a second solvent selected from a group consisting of methylethyl ketone, pyridine, methyl formate, n-propyl acetate, ethyl ether, methylethyl carbonate, toluene, fluorotoluene, benzene, fluorobenzene, p-dioxane, and cyclohexane, and an electrolyte salt; and

a positive electrode comprising a positive active material comprising at least one sulfur-based material selected from a group consisting of a sulfur element,  $\text{Li}_2\text{S}_n$  ( $n \geq 1$ ), an organic sulfur compound, and a carbon-sulfur polymer ( $(\text{C}_2\text{S}_x)_n$  where  $x=2.5$  to 50 and  $n \geq 2$ ), and an electrically conductive material,

wherein

the first solvent is roughly between 20% and 40% by volume of the electrolyte, and

the second solvent is roughly between 80% and about 60% by volume of the electrolyte.

11. (PREVIOUSLY PRESENTED) A lithium-sulfur battery comprising:

a positive electrode including an active material including lithium;

a negative electrode including another active material including sulfur; and

an electrolyte disposed between the positive and negative electrodes, the electrolyte comprising

a first solvent having a polarity high enough to dissolve an ionic compound;

a second solvent selected from a group consisting of methylethyl ketone, pyridine, methyl formate, n-propyl acetate, ethyl ether, methylethyl carbonate, toluene, fluorotoluene, benzene, fluorobenzene, p-dioxane, and cyclohexane; and

an electrolyte salt,

wherein

the first solvent is between 20% inclusively and 40% by volume of the electrolyte, and

the second solvent is roughly between 80% and about 60% by volume of the electrolyte.

12. (PREVIOUSLY PRESENTED) A lithium-sulfur battery comprising:

a negative electrode comprising a negative active material including sulfur;  
an electrolyte comprising

a first solvent having a polarity high enough to dissolve an ionic compound,

a second solvent selected from a group consisting of methylethyl ketone,

pyridine, methyl formate, n-propyl acetate, ethyl ether, methylethyl carbonate, toluene,  
fluorotoluene, benzene, fluorobenzene, p-dioxane, and cyclohexane, and

an electrolyte salt; and

a positive electrode comprising a positive active material including lithium,  
wherein

the first solvent is roughly between 20% and 40% by volume of the electrolyte,

and

the second solvent is between 60% and 80% inclusively by volume of the  
electrolyte.

13. (ORIGINAL) The lithium-sulfur battery of claim 12, wherein the first solvent has  
a dielectric constant that is greater than or equal to 20.

14. (PREVIOUSLY PRESENTED) A lithium-sulfur battery comprising:

a negative electrode comprising a negative active material;

an electrolyte comprising

a first solvent having a polarity high enough to dissolve an ionic compound,

a second solvent selected from a group consisting of methylethyl ketone,

pyridine, methyl formate, n-propyl acetate, ethyl ether, methylethyl carbonate, toluene,  
fluorotoluene, benzene, fluorobenzene, p-dioxane, and cyclohexane, and

an electrolyte salt; and

a positive electrode comprising a positive active material,

wherein:

the first solvent is at least one selected from a group consisting of methanol,  
hexamethyl phosphoramide, ethanol, and isopropanol,

the first solvent is roughly between 20% and 80% by volume of said electrolyte,  
and

the second solvent is roughly between 20% and about 80% by volume of said

electrolyte.

15. (CANCELLED)

16. (PREVIOUSLY PRESENTED) The lithium-sulfur battery of claim 14,  
wherein:

the first solvent is roughly between 20% and 40% by volume of said electrolyte, and  
the second solvent is roughly between 80% and about 60% by volume of said electrolyte.

17. (PREVIOUSLY PRESENTED) The lithium-sulfur battery of claim 14,  
wherein a ratio of the first solvent to the second solvent is roughly 1:1.

18-28. (CANCELLED)

29. (PREVIOUSLY PRESENTED) The lithium-sulfur battery of claim 4, wherein  
the first solvent is at least one selected from a group consisting of ethylene carbonate, propylene  
carbonate, dimethyl sulfoxide, sulfolane,  $\gamma$ -butyrolactone, acetonitrile, dimethyl formamide,  
methanol, hexamethyl phosphoramide, ethanol, and isopropanol.

30. (CANCELLED)

31. (PREVIOUSLY PRESENTED) The lithium-sulfur battery of claim 10,  
wherein said first solvent is at least one selected from a group consisting of methanol,  
hexamethyl phosphoramide, ethanol, and isopropanol.

32. (PREVIOUSLY PRESENTED) The lithium-sulfur battery of claim 10,  
wherein the second solvent is between 60% and 80% inclusively by volume of the electrolyte.

33. (PREVIOUSLY PRESENTED) The lithium-sulfur battery of claim 10,  
wherein the first solvent is between 20% inclusively and 40% by volume of the electrolyte.

34. (PREVIOUSLY PRESENTED) The lithium-sulfur battery of claim 10,  
wherein the second solvent is substantially 80% by volume of the electrolyte.

35. (PREVIOUSLY PRESENTED) The lithium-sulfur battery of claim 10,  
wherein the first solvent is substantially 20% by volume of the electrolyte.
36. (PREVIOUSLY PRESENTED) The lithium-sulfur battery of claim 14,  
wherein the second solvent is between 70% and 80% inclusively by volume of the electrolyte.
37. (PREVIOUSLY PRESENTED) The lithium-sulfur battery of claim 14,  
wherein the first solvent is between 20% inclusively and 40% by volume of the electrolyte.
38. (PREVIOUSLY PRESENTED) The lithium-sulfur battery of claim 14,  
wherein the second solvent is substantially 80% by volume of the electrolyte.
39. (PREVIOUSLY PRESENTED) The lithium-sulfur battery of claim 14,  
wherein the first solvent is substantially 20% by volume of the electrolyte.
40. (PREVIOUSLY PRESENTED) The lithium-sulfur battery of claim 14,  
wherein said first solvent is at least one selected from a group consisting of methanol,  
hexamethyl phosphoramide, ethanol, and isopropanol.
- 41-42. (CANCELLED)
43. (PREVIOUSLY PRESENTED) An electrolyte for a lithium-sulfur battery  
having a positive and negative electrode, comprising:  
    a first solvent having a dielectric constant that is greater than or equal to 20;  
    a second solvent selected from a group consisting of methylethyl ketone, pyridine, methyl  
formate, n-propyl acetate, ethyl ether, methylethyl carbonate, toluene, fluorotoluene, benzene,  
fluorobenzene, p-dioxane, and cyclohexane; and  
    an electrolyte salt,  
wherein:  
    said first solvent is at least one selected from a group consisting of methanol,  
hexamethyl phosphoramide, ethanol, and isopropanol, and  
    the first solvent is roughly between 20% and 80% by volume of the electrolyte.